CEO Sensation Seeking and Financial Reporting Quality

Abstract

This study investigates whether CEOs' sensation seeking is related to their firms' financial reporting quality. Consistent with a tendency of sensation seekers to defy ethical rules, we find that firms with sensation-seeking CEOs have lower financial reporting quality and higher likelihood of accounting fraud. More specifically, we find that firms led by sensation-seeking CEOs engage in more accrual-based and real earnings management, have higher information opacity and are more likely to have internal control deficiencies and use less conservative accounting. Firms with sensation-seeking CEOs are also more likely to engage in accounting fraud as indicated by the SEC Accounting and Auditing Enforcement Release (AAER). We further find that good corporate governance does not mitigate the adverse effects of sensation-seeking CEOs on financial reporting quality. Finally, we find a positive association between sensation-seeking CEOs and audit fees. Our results are robust to CEO change, instrument variable method and propensity score matching. In summary, our results suggest that the CEO personality trait of sensation seeking plays an important role in financial reporting quality.

Keywords: CEO sensation seeking, private pilot licenses, earnings management, information opacity, AAER restatement, internal control material weaknesses

JEL: G12 G15

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1. Introduction

Recent empirical studies in accounting and finance show that managerial personality traits can and do significantly influence important corporate decisions such as acquisitions, leverage, voluntary disclosure, earnings management and tax avoidance (e.g., Adams, Almeida, and Ferreira 2005; Malmendier and Tate 2005; Bamber, Jiang, and Wang 2010; Dyreng, Hanlon, and Maydew 2010; Bebchuk, Cremers and Peyer 2011; Benmelech and Frydman 2015). Relatively unknown is whether the personality trait of sensation seeking, defined by the search for novel experiences and the readiness to take risks for such experiences (Zuckerman, 1979), is related to financial reporting quality. We specifically examine whether CEOs' sensation seeking is associated with lower quality of financial reporting, as well as higher likelihood of accounting fraud.

We hypothesize that sensation-seeking CEOs are more likely to defy accounting regulations and opportunistically disclose accounting information than non-sensation-seeking CEOs, and thus the financial reporting quality of firms with sensation-seeking CEOs tends to be lower. This hypothesis draws on important findings in psychology literature. The psychology literature defines the trait of sensation seeking as "the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience" (Zuckerman, 1979). Sensation seeking has four sub-traits: Thrill and adventure seeking; Experience seeking; Disinhibition; Boredom susceptibility (Zuckerman, Eysenck and Eysenck, 1978). Of particular relevance to this study is the sub-trait of disinhibition, defined as strong preference for intense out of control activities or unethical activities such as drug consumption, risky driving and illegal activities (Zuckerman, Eysenck and Eysenck,

1978). Psychology literature suggests disinhibited individuals are more likely to commit unethical behaviors and frauds (Patrick, Fowles, & Krueger, 2009).

Following the psychology literature and finance literature (Zuckerman 1979; Cain and McKeon 2016; Sunder et al. 2017), we use the possession of a pilot license as an empirical proxy for the trait of sensation seeking. We analyze the impact of CEOs' sensation seeking on financial reporting quality by comparing the financial reporting quality of pilot CEO firms with that of non-pilot CEO firms. We propose that those who seek sensational experiences in their personal life, such as piloting an airplane, are more likely to pursue risks in financial reporting decisions.[1] Our sample consists of 11,194 firm-year observations of pilot and non-pilot CEOs between 1992 and 2010. We first examine the implication of CEO sensation seeking for financial reporting quality. Consistent with the empirical evidence in psychology literature of the association between sensation seeking and unethical behaviors, our empirical evidence suggests that firms led by pilot CEOs engage in more accrual-based and real earnings management, have higher information opacity and higher likelihood of internal control deficiencies, and use less conservative accounting. Additionally, we find that stronger corporate governance does not mitigate the adverse effects of pilot CEOs on financial reporting quality.

Next, we explore the relationships between CEO sensation seeking and earnings management outside of generally accepted accounting principles (GAAP), i.e. accounting fraud, since psychology research suggests that high sensation seekers are more likely to commit acts of deception (Lu 2008; DeAndrea et al. 2009; Dickey 2014). We find that sensation-seeking CEOs are related to higher incidence of engaging in

[1] There is an emerging stream of literature in accounting and finance that applies behavioral consistency theory and links personality traits to corporate decision making (e.g. Cronqvist et al. 2012; Chyz 2013; Davidson et al. 2015; Bushman et al. 2017). We discuss those studies in literature review.

accounting fraud as indicated by the Accounting and Auditing Enforcement Release (AAER).

Finally, we examine whether there is any third-party consequences related to CEO sensation seeking. We assess the response of auditors to CEO sensation seeking. We focus on the sensitivity of auditors to sensation-seeking CEOs because auditors are a unique group of stakeholders who have insider-like access to accounting records and are very sensitive to financial reporting quality due to litigation concerns (DeFond and Zhang, 2014). We find that auditors charge firms led by pilot CEOs higher audit fees, suggesting that auditors do take CEO sensation seeking into account when setting their prices.

As sensation-seeking CEOs are not randomly assigned to firms in our sample, we are unable to exclude the possibility of unobserved firm characteristics contaminating our results and make a definite causal inference. For example, sensation-seeking CEOs with observable management styles may be attracted to certain firms. In the robustness checks, we employ an instrument variable and the propensity score matching method to address this issue. Our results remain robust.

We make the following important contributions to the literature: (1) To our best knowledge, this is the first study to examine the relationship between sensation seeking and financial reporting quality. Our study identifies a new individual-level determinant of financial reporting quality: CEOs' sensation seeking. (2) We add to the emerging literature on the relationship between CEO characteristics and financial reporting quality by documenting a negative relationship between CEOs' sensation seeking and financial reporting quality. Huang et al. (2012) investigate CEO age and financial reporting, while Schrand and Zechman (2012) examine managerial overconfidence and fraud. Ahmed and Duellman (2013) find a relationship between CEO overconfidence

and accounting conservatism. (3) We also contribute to the literature on CEO sensation seeking. Cain and McKeon (2016) suggest that CEO sensation seeking is positively associated with aggressive investment policy[2]. Sunder et al. (2017) demonstrate that sensation-seeking CEOs are more innovative. Our evidence indicates that CEO sensation seeking exacerbates the agency conflict between managers and shareholders since pilot CEOs engage in more earnings management, and their firms have a lower accounting quality. Taken together, these studies provide empirical evidence on how CEO sensation seeking affects corporate behavior in an agency problem setting.

Our study is subject to some limitations. First, as with other psychological traits, sensation seeking is not directly observable. Although piloting is a well-validated empirical proxy of sensation seeking adopted in prior research (Cain and McKeon 2016; Sunder et al. 2017), we acknowledge sensation seeking is a multi-faceted construct and the interpretation of our results may be influenced by the validity of this empirical proxy. Nonetheless, our evidence shows the personal trait of sensation seeking is an important consideration in financial reporting quality. Second, our results, as other empirical accounting research, are subject to bias of endogeneity. Although we cannot unambiguously rule out endogenous explanations, our results are robust to a battery of rigorous econometrics tests, including difference-in-differences, instrument variable, and propensity score matching analyses.

The remainder of the paper is organized as follows. We discuss prior literature and develop our hypotheses in Section 2. Section 3 describes the sample selection process and presents descriptive statistics. Section 4 discusses the results of our main analyses, and Section 5 presents the results of additional analyses. Section 6 provides

[2] While Cain and McKeon (2016) explore the risk-taking behaviors of pilot CEOs, they acknowledge that it is the construct of sensation seeking that bestows pilot CEOs with higher appetite for risk."

the results of robustness checks, and finally Section 7 concludes the study.

2. Prior Literature and Hypothesis Development

2.1. The Trait of Sensation Seeking

Personality traits have been conceptualized from a variety of theoretical perspectives and the field of personality psychology has put forth a general taxonomy of personality traits known as the five-factor model of personality: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Tupes and Christal 1961). Openness to experience is a general appreciation for adventure, unusual ideas, and novel experience. The definition of the trait of sensation seeking is developed on the basis of openness in the five-factor model and is subsequently defined in the psychology literature as "the need for varied, novel, and complex sensations and experiences and the willingness to take physical and social risks for the sake of such experience" (Zuckerman 1979, page 10). Traditional psychological research has demonstrated that the level of sensation seeking is influenced by genetic, biological, psychophysiological and social factors and affects certain behaviors and attitudes such as occupational choice, recreation, lifestyle, social interactions and financial decisions (Zuckerman 1979).

Sensation seeking has four sub-traits: Thrill and adventure seeking; Experience seeking; Disinhibition; Boredom susceptibility satisfaction (Zuckerman, Eysenck and Eysenck, 1978). The link between sensation seeking and financial reporting quality hinges on the sub-trait of disinhibition, which is defined as strong preference for intense out of control activities or unethical activities such as drug consumption, risky driving and illegal activities (Zuckerman, Eysenck and Eysenck, 1978). Disinhibition is an externalized trait which is indicative of irresponsibility, impulsivity, aggressiveness, and disrespect of ethics (Patrick, Fowles, & Krueger, 2009). A disinhibited individual

lacks proper ethical prudence and the ability to anticipate the consequences of his/her actions. The disinhibited individual also demonstrates impaired emotional regulation and impulsive behaviors. Disinhibition is considered as the least socially acceptable sub-trait of sensation seeking due to its potentially destructive effect on ethics and social order (Zuckerman, Eysenck and Eysenck, 1978).

Extensive psychological studies have provided strong empirical evidence that sensation seekers with high level of disinhibition are more likely to ignore constraints and disrespect ethics (Zuckerman, 1979). The wide variety of unethical behaviors identified in the psychological studies include cheating in both personal life and in career (Lu 2008), drug and alcohol abuse (DeAndrea et al. 2009; Dickey 2014), white-collar crime and conventional crime (Craig and Piquero 2017), street violence (Nussio, 2017), traffic violations (Oppenheim, Oron-Gilad, Parmet and Shinar, 2016) and delinquencies (Ljubin-Golub, Vrselja, and Pandžić, 2016).

2.2. Attributes of Financial Reporting Quality

A large body of literature examines the determinants of financial reporting quality. As summarized by Dechow et al. (2010), firm size, debt and firm performance are found to influence financial reporting quality. Earlier literature suggests that financial reporting quality decreases as firm size increases since larger firms are more likely to engage in income-decreasing manipulation to avoid regulatory scrutiny (Watts and Zimmerman 1986). However, recent papers find that firm size is positively correlated with financial reporting quality (Carcello and Nagy 2004; Ashbaugh-Skaife et al. 2007). Firms with higher leverage are more likely to engage in income-increasing earnings management (DeFond and Jiambalvo 1994; Dichev and Skinner 2002; Beatty and Weber 2003). Traditional auditing literature (Becker et al. 1998; Behn et al. 2008) believes auditor size (such as Big N) is positively correlated with financial reporting

quality. However, using propensity score matching, recent literature has shown that the relation between Big N and financial reporting quality is insignificant (Lawrence et al. 2011).

An emerging literature has investigated the effects of CEO characteristics on firms' financial reporting quality. Huang et al. (2012) investigate the relationship between CEO age and the accounting quality of firms. They find that firms with older CEOs have higher accounting quality, measured by whether the firms are able to meet or beat analyst forecasts. Schrand and Zechman (2012) examine managerial overconfidence and fraud, and they document overconfident executives are more likely to commit accounting frauds. Ahmed and Duellman (2013) predict and find that overconfident CEOs tend to delay loss recognition and exhibit lower accounting conservatism. The reason is that such CEOs usually overestimate future investment returns.

In summary, prior literature has investigated the effects of various firm or CEO characteristics on financial reporting quality. However, the impact of CEO sensation seeking on financial reporting quality has not been studied. We seek to fill this void by providing empirical evidence.

2.4. Hypothesis Development

Motivated by behavioral consistency theory which suggests that individuals behave in a consistent manner across similar situations, we predict that CEOs with a higher level of sensation seeking are more likely to misreport accounting numbers.

Behavioral consistency theory is well established in psychology and suggests that personality traits are relatively stable and are not determined or influenced by situational variables or contextual changes (Allport 1937; 1966). Epstein (1979) finds that stability coefficients increase as the measures of behavior are averaged over an

increasing number of events. He concludes that it is possible to predict behavior based on the average of a sample of situations and/or occasions. Behavioral consistency theory argues that how one behaves in one situation is predictable from how one behaves in similar situations. Using the findings from two experiments, Stone et al. (2002) conclude that many of the findings from risk research on individual decision making concerning financial situations can be generalized to decision making for others.

There is an emerging literature in finance and accounting that applies behavioral consistency theory and links personality traits to corporate decision making. These studies examine how a CEO's behavior at work and his or her behavior outside of work are related. Cronqvist et al. (2012) suggest that a CEO who assumes a large amount of leverage in his or her personal finances will do the same in corporate finance. Chyz (2013) shows that managers who avoid personal tax aggressively are more likely to use tax shelters at the firm level. Benmelech and Frydman (2015) demonstrate that military CEOs with a higher sense of ethics are less likely to engage in corporate fraud. Davidson et al. (2015) find that managers' behaviors and preferences outside of work, such as luxury goods ownership and law infringement, are related to financial reporting quality. Specifically, they show that managers who like to own luxury goods are more likely to misreport earnings and managers with prior legal infractions are associated with a corrupt financial reporting environment. Bushman et al. (2017) demonstrate that materialistic CEOs, or CEOs owning luxury goods, are associated with lax firm risk management.

Following behavioral consistency theory (Epstein 1979; Stone et al. 2002), we argue that risk-takers who seek sensational experiences in their personal life, such as piloting an airplane, are more likely to pursue risks in financial reporting decisions. Agency theory suggests that managers have incentives to misreport accounting

numbers to extract private benefits (Cheng and Warfield 2005). However, accounting misreporting comes with considerable risks which managers must bear if it is exposed. The risks include compensation penalties (Dechow et al. 1996), reputational loss (Desai et al. 2006), and job termination (Efendi et al. 2013). Risk-takers believe that the benefits of the sensational experiences are worth pursuing and pay less attention to the risk of being caught (Zuckerman 1979). As financial reporting manipulation is akin to taking a gamble in that one could get caught, sensation-seeking CEOs are more likely to focus on the benefits of accounting misreporting and emphasize the probability of *not* being caught, and they are more willing to take the risk of being found out. We thus propose the following hypothesis:

Hypothesis: *Firms led by sensation-seeking pilot CEOs have lower financial reporting quality.*

3. Main Variables, Data Sources, Sample, and Descriptive Statistics

3.1. Sample Selection and Data Sources

Panel A of Table 1 presents the sample selection procedure. We begin with all 31,885 firm-year observations having CEO data available in the ExecuComp database from the year 1992 to 2010.[3] We exclude 4,361 observations in the financial services and utility industries. We drop 9,714 observations without sufficient data to calculate CEO characteristics measures such as pilot CEO, CEO age, and CEO tenure. Lastly, we exclude 5,616 observations that do not have sufficient data to calculate financial reporting quality and control variables. Our final sample consists of 11,194 firm-year observations. We extract financial data from Compustat, stock return data from CRSP and CEO characteristics data from ExecuComp.

Panel B of Table 1 presents the sample distribution by year. The sample size

[3] We conclude at 2010 since it is the last year for which we have pilot CEO information.

varies over time, ranging from a low of 34 observations in 1992 to a high of 831 observations in 2003. We start our sample from the year 1992 because CEO-related variables are available from 1992 onward.[4]

3.2 Main Variables

3.2.1 CEO Sensation Seeking

Following Cain and McKeon (2016) and Sunder et al. (2017), we measure CEO's sensation seeking using whether a CEO has a private pilot license. Cain and McKeon (2016) collect CEO names from ExecuComp and pilot names from the Federal Aviation Administration (FAA)'s Airmen Certification Database.[5] If a name is not found in the FAA database, they assume that this CEO is not a pilot. If a name is found in the FAA database, to verify the match they collect additional information such as age, home and firm address, and other personal information from the following databases: LexisNexis, Bloomberg, and other public resources. In this paper, we define Pilot CEO as an indicator variable that is equal to one if a CEO holds a pilot license and zero otherwise.[6] Our final sample consists of 108 pilot CEOs and 2,304 non-pilot CEOs between 1992 and 2010.

According to data provided by the life insurance industry, piloting small aircraft is a dangerous activity and associated with increased levels of health risk.[7] For a 40-year-old male who qualifies for standard (average life expectancy) policies, McFall (1992) finds that there is a 100% increase in the mortality rate from piloting small airplanes.[8] For individuals only qualifying for substandard (high risk) policies, there is a 200% increase in mortality rate associated with piloting small aircraft. Cain and

[4] Our results are still robust after excluding the 34 observations of 1992.
[5] http://www.faa.gov/licenses_certificates/airmen_certification/releasable_airmen_download/
[6] We thank Matthew D. Cain and Stephen B. McKeon for providing the data.
[7] Most pilot CEOs only have licenses to operate small airplanes. Cain and McKeon (2016) also provide evidence that CEOs in the sample operate airplanes for hobby, not for business use.
[8] These are civilian aviators flying for hobby, the category to which most pilot CEOs belong.

McKeon (2016) show that the fatality rate for personal/business flying is 21.5 fatalities per million hours, which makes it 30 times more dangerous than driving and the most dangerous activity among the nine forms of activities they analyze.[9] The evidence from McFall (1992) and Cain and McKeon (2016) clearly shows that piloting small airplanes is associated with elevated sensation seeking.

3.2.2 Financial Reporting Quality

Following Chi et al. (2011) and McGuire et al. (2012), we employ several measures to capture financial reporting quality: accrual-based earnings management, information opacity, and AAER accounting fraud.

First, we estimate the absolute abnormal accruals from the modified Jones model (*AM1*) (Jones 1991; DeFond and Jiambalvo 1994; Dechow et al. 1995) and the ROA-adjusted modified Jones model (*AM2*) (Kothari et al. 2005) to proxy for accrual-based earnings management.

Second, Hutton et al. (2009) investigate the relation between the transparency of financial statements and the distribution of stock returns. They find that firms with higher information opacity have higher synchronicity, indicating less firm-specific information available for these firms. Following Hutton et al. (2009), we use the moving sum of three years' absolute value of discretionary accruals from the modified Jones model (*AM1*) and that from the ROA-adjusted modified Jones model (*AM2*) to capture information opacity (*Information Opacity 1* and *Information Opacity 2*).

Lastly, following Davidson et al. (2015), we use the Securities and Exchange Commission (SEC) Accounting and Auditing Enforcement Release (AAER) fraud as a measure of financial reporting quality. As DeFond and Zhang (2014) suggest, AAER

[9] The nine forms of activities Cain and McKeon (2016) analyze are: (i) personal/business flying, (ii) motorcycles, (iii) hot air balloons, (iv) personal helicopters, (v) 'crop dusters,' (vi) commercial helicopters, (vii) corporate/executive flying, (viii) passenger cars, and (ix) commercial airlines.

accounting fraud has fewer measurement errors than other accounting quality measures.

3.3 *Descriptive Statistics*

Panel A of Table 2 reports the descriptive statistics for our sample. On average, 5.1% of CEOs are classified as pilot CEOs, which is consistent with Cain and McKeon (2016). The means (medians) of *AM1*, *AM2*, *Information Opacity 1*, *Information Opacity 2*, *RM1* and *RM2* are 0.064 (0.061), 0.076 (0.072), 0.236 (0.173), 0.204 (0.147), 0.033 (0.377) and 0.003 (0.248), respectively. Generally, these statistics are consistent with the prior literature (Kothari et al. 2005; Hutton et al. 2009; Gunny 2010; McGuire et al. 2011; Zang et al. 2011).

About 1.7% of the firms engage in AAER accounting fraud. On average, 8.9% of sample firms report significant deficiencies or material weaknesses in their internal controls. Only 0.2% of firms report fraud-related internal control weaknesses. Regarding CEO characteristics, 72.5% firms have CEOs over 60 years of age. Around 2.6% of firms have female CEOs. The average CEO tenure is four years. As for firm characteristics, the average firm assets is 1356.95 million dollars and has a leverage of 51.9%. About 69.2% of the firms are audited by Big N auditors, and the average auditor tenure is nine years.

Panel B of Table 2 reports the Pearson correlations between pilot CEOs and financial reporting quality measures. We find that pilot CEOs are positively correlated with *AM1*, *Information Opacity 1*, *Information Opacity 2*, *AAER*, and *Fraud_ICW_404*, which provides preliminary support for the hypothesis that firms with pilot CEOs are associated with lower quality of financial reporting. To more convincingly establish the relationship between sensation-seeking pilot CEOs and financial reporting quality, next we consider confounding factors such as CEO age and gender which may affect the quality of financial reporting in multivariate regressions.

4. Methodology and Empirical Results

4.1. Methodology

We estimate the relation between CEO sensation seeking and financial reporting quality using the following regression model:

$$\textit{Financial Reporting Quality} = \beta_0 + \beta_1 \textit{Pilot CEO} + \beta_2 \textit{Age50-59} + \beta_3 \textit{Age>=60} + \beta_4 \textit{Female CEO} + \beta_5 \textit{Ln(Tenure)} + \beta_6 \textit{Overconfidence} + \beta_7 \textit{Delta} + \beta_8 \textit{Vega} + \beta_9 \textit{SIZE} + \beta_{10} \textit{Firm Age} + \beta_{11} \textit{Inventory Ratio} + \beta_{12} \textit{LEV} + \beta_{13} \textit{NOA} + \beta_{14} \textit{Big N} + \beta_{15} \textit{Auditor Tenure} + \beta_{16} \textit{Sales Growth} + \beta_{17} \textit{Operating Volatility} + \textit{Industry Fixed Effects} + \textit{Year Fixed Effects} + \varepsilon \quad (1)$$

where *Financial Reporting Quality* refers to one of the following: accrual-based earnings management, information opacity, and AAER accounting fraud.

Following prior studies such as Cain and McKeon (2016), we control for CEO age (*Age50-59*; *Age>=60*),[10] CEO gender (*Female CEO*), CEO tenure (*Ln(Tenure)*), CEO overconfidence (*Overconfidence*) and CEO risk-taking (*Delta* and *Vega*). Drawing on prior studies (Lobo and Zhou 2006; Hutton et al. 2009; Dechow, Ge and Schrand 2010; Gunny 2010; McGuire et al. 2011; Zang et al. 2011), we control for firm characteristics, including the natural log of the book value of assets (*SIZE*), the natural log of the number of years since the year a firm first appeared in Compustat (*Firm Age*), inventory scaled by total assets (*Inventory Ratio*), total liabilities scaled by total assets (*LEV*), the sum of shareholders' equity less cash and marketable securities plus total debt at the beginning of the year, scaled by total assets at the beginning of the year (*NOA*), Big N auditor (*Big N*), sales growth (*Sales Growth*), the natural log of the number of years the auditor has been working with the firm (*Auditor Tenure*), and the standard deviation of operating cash flows scaled by total assets over the past five fiscal years (*Operating Volatility*). Finally, we include industry and year dummies to control

[10] We have also tried classifying CEO age into three groups: 50-55, 56-59 and >=60. Our results are robust to this classification.

for industry and year fixed effects. Appendix A describes in detail all variables used in the model.

4.2. Main Results

4.2.1. CEO Sensation Seeking and Accrual-based Earnings Management [11]

Table 3 presents the estimation results relating CEO sensation seeking to accrual-based earnings management. We find that accrual-based earnings management is positively related to pilot CEOs, as indicated by the coefficient β_1, which equals 0.008 with a t-value of 2.38 for accrual-based earnings management *AM1*. The results for *AM2* are similar. Firms with pilot CEOs engage in more accrual-based earnings management than firms without pilot CEOs. As for economic significance, the extent of accrual-based earnings management of firms with pilot CEOs is 0.008 larger than that of firms without pilot CEOs. The economic impact of pilot CEOs on accrual earnings management is 10.53% of our sample mean *AM1* of 0.064 and 9.21% of our sample mean *AM2* of 0.076, which is clearly nontrivial. These results show that the possession of a private pilot license is associated with more aggressive accrual-based earnings management.

The results for the control variables are mostly consistent with prior research (Lobo and Zhou 2006; Dechow, Ge and Schrand 2010; McGuire et al. 2011; Zang et al. 2011). Firms with a higher inventory ratio, leverage, and sales growth engage in more accrual-based earnings management. Firms with longer-tenured CEOs, firms of larger size, firms with higher net operating assets, firms associated with Big N auditors, and

[11] We have also investigated the relationship between CEO sensation seeking and real earnings management. We find that sensation-seeking CEOs (proxied by the possession of a pilot license) are more likely to engage in real earnings management. We omit these results for several reasons. First, real earnings management is harder to catch and easier for managers to justify. Second, there is no risk to managers in real earnings management, as it is not an illegal activity so there is no litigation concern and it does not involve manipulating the numbers within GAAP so there is no auditing concern. Third, real activities such as real earnings management are operating decisions and not reporting decisions.

older firms engage in less accrual-based earnings management.

4.2.2 CEO Sensation Seeking and Information Opacity

Table 4 presents the estimation results relating CEO sensation seeking to information opacity. The dependent variables are the moving sum of three years' absolute value of discretionary accruals from the modified Jones model (*AM1*) and that from the ROA-adjusted modified Jones model (*AM2*) (Hutton et al. 2009). The coefficient on *Pilot CEO* is 0.033 in column (1) and 0.020 in column (2), with p-values less than 0.01 (t-values = 4.62 and 3.64). Both information opacity measures are higher for firms with pilot CEOs. These findings complement the evidence in Table 4. We continue to find that firms with pilot CEOs have lower accounting quality as measured by information opacity. The economic impact of pilot CEOs on information opacity is 13.98% of the sample mean of 0.236 and 9.80% of the sample mean of 0.204. Overall, pilot CEOs have an economically significant impact on information opacity.

For the control variables, we find that firms with higher inventory ratio and longer auditor tenure have higher information opacity. Firms with longer-tenured CEOs, firms of larger size, older firms, firms with higher net operating assets, and firms with larger sales growth all have lower information opacity.

4.2.3 CEO Sensation Seeking and AAER Accounting Fraud

Following Davidson et al. (2015), we use AAER accounting fraud to capture financial reporting quality. Table 5 presents the results relating CEO sensation seeking and AAER accounting fraud. We find that pilot CEOs are positively related to AAER accounting fraud, as indicated by the coefficient β_1, which equals 0.028 with a t-value of 3.22. The results are also economically significant. Specifically, firms with pilot CEOs are 2.84% more likely to be involved in AAER accounting fraud.[12]

[12] The value is calculated as (e^0.028-1) = 0.0284.

Among the control variables, firms with CEOs between 50 and 59 years of age, overconfident CEOs, larger assets, higher net operating assets, and higher inventory ratios are more likely to engage in AAER accounting fraud. Firms audited by Big N auditors are less likely to engage in AAER accounting fraud.

4.2.4 CEO Sensation Seeking and Financial Reporting Quality: Corporate Governance Effects

Gompers, Ishii, and Metrick (2003) find that firms with stronger corporate governance, measured by the governance index (G-index), have higher profits, higher sales growth, and are associated with a higher firm value. Agrawal and Chadha (2005) examine the relation between corporate governance and accounting restatement. They find that the independence and financial expertise of boards and audit committees are negatively correlated with earnings restatement, indicating that corporate governance play a role in constraining managers' earnings manipulation.

In this paper, we test whether corporate governance moderates the relationship between pilot CEOs and financial reporting quality. Following Gompers, Ishii, and Metrick (2003), we use the G-index to capture the strength of corporate governance. A higher G-index indicates poorer external corporate governance. Corporate governance is equal to one if the G-index is below the sample median and zero otherwise.

Table 6 reports the regression results after considering the impact of corporate governance on financial accounting quality. Columns (1) to (4) and (7) show that the interaction term is insignificant, indicating that stronger corporate governance does not mitigate the relation between pilot CEOs and financial reporting quality as measured by accrual-based earnings management (*AM1* and *AM2*), information opacity (*Opacity1* and *Opacity2*) and AAER.

Taken together, we find that better corporate governance does not mitigate the

adverse effect of pilot CEOs on financial reporting quality.

5. Additional Analysis

5.1 CEO Sensation Seeking and Internal Control Quality

According to SEC (SEC 2004), internal control over financial reporting refers to the set of "controls that pertain to the preparation of financial statements for external purposes that are fairly presented in conformity with generally accepted accounting principles."[13] A deficiency or material weakness in the internal control system could cause a decrease in financial reporting quality and an increase in the probability of restatement (PCAOB, 2007).[14, 15]

We define an indicator variable, ICD, that is equal to one if a firm has a significant deficiency or material weakness in internal controls and zero otherwise. We examine how CEO personal sensation seeking influences internal control quality. Table 7 reports the results. Consistent with our prediction, we find that the coefficient on pilot CEO is significantly positive (β_1=0.036, t value=2.10) in column (1) of Table 7. Based on severity, prior literature (Doyle et al. 2007; Kim et al. 2011) has usually classified ICD into two categories: account-level and company-level ICD. This paper is mainly concerned with the effect of CEO sensation seeking on financial reporting quality and accounting fraud is one of the most severe financial reporting irregularities. We thus classify ICD into fraud and non-fraud level ICD. Fraud-level ICD indicates that the

[13] For SEC Management's Report on Internal Control over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports (October 6, 2004), visit https://www.sec.gov/rules/final/33-8238.htm#iia

[14] Audit Standard 2201 (A7) defines a significant deficiency as "a deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis. ."

[15] Audit Standard No. 2201 (A11) defines a material weakness as "a deficiency, or a combination of deficiencies, in internal control over financial reporting that is less severe than a material weakness, yet important enough to merit attention by those responsible for oversight of the company's financial reporting. ."

assessment of disclosure controls has identified financial fraud, irregularities, and misrepresentations.

The results in column (2) show that *Pilot CEO* is positively correlated with *Fraud_ICD* (β_1=0.005, T value=2.17), indicating that firms with pilot CEOs are more likely to have fraud-related internal control issues. Column (3) shows that the coefficient of pilot CEOs is positive and significant (β_1=0.030, T value=1.79). These results indicate that firms with pilot CEOs have lower internal control quality, consistent with the results on pilot CEOs and accrual-based earnings management as well as information opacity.

5.2 CEO Sensation Seeking and Accounting Conservatism

Following Basu (1997) and Watts (2003), we define accounting conservatism as "the tendency to recognize losses more timely than gains." Table 8 presents the relationship between pilot CEOs and accounting conservatism. Panel A presents the results for accounting conservatism based on the Basu (1997) return model. In this model, the variable of interest is the interaction between return and its sign. A greater interaction equates to higher accounting conservatism, which indicates that earnings reflect bad news timelier than they do about good news. Column (1) presents a relatively simple model, including the original Basu variables and variables related to pilot CEOs. This column shows that the coefficient on the interaction term *DR*Return* is significantly positive (the coefficient is 0.307 with a t-value of 9.77). The coefficient on *Pilot CEO*DR*Return* is significantly negative (the coefficient is -0.341 with a t-value of -4.20). In column (2), we further control for confounding variables such as SIZE, LEV and CEO overconfidence. We continue to find a significantly negative coefficient on *Pilot CEO*DR*Return* (the coefficient is -0.253 with a t-value of -2.82). This shows that companies with pilot CEOs are associated with less accounting

conservatism. In column (2), we control for CEO overconfidence. The coefficient on *Overconfidence*DR*Return* is significantly negative (the coefficient is -0.021 with a t-value of -2.94), which shows that firms with overconfident CEOs incorporate good news more aggressively than they do about bad news. This is consistent with Ahmed and Duellman (2013). The pilot CEO results still hold after controlling for CEO overconfidence, which shows that overconfidence and sensation seeking as proxied by the possession of a pilot license capture two distinct CEO characteristics.

Panel B presents the regression results using an alternative measure of accounting conservatism: the net income change model (Basu 1997). The results continue to show that firms with pilot CEOs are less likely to exhibit accounting conservatism.

5.3 CEO Sensation Seeking and Audit Pricing

The results so far demonstrate that CEO sensation seeking is associated with lower financial reporting quality. In this part, we examine whether auditors consider CEO personal risk-taking when setting their audit fees. A motivation for this part of the study is that Public Company Accounting Oversight Board (PCAOB) Release No. 2014-002 calls for auditors to pay attention to the behaviors of executive officers. Chen et al. (2015) find that firms with higher sensitivity of CEO compensation to stock return volatility (*Vega*) are charged higher audit fees. Cain and McKeon (2016) show that firms with pilot CEOs are more likely to employ higher Vega compensation structure. Thus, we predict that auditors would charge firms led by pilot CEOs higher audit fees.

Our results are consistent with the prediction that CEO sensation seeking is reflected in audit fees. After controlling for other confounding factors, Table 9 shows that the coefficient of pilot CEOs is positive and significant (the coefficient is 0.104

with a t-value of 2.87). This result is also economically significant. Audit fees for firms with pilot CEOs are 10.96% ($e^{0.104} - 1$) higher than those for firms without pilot CEOs.

6. Robustness Checks

6.1. The Difference in Difference Method: CEO Turnover

To potentially identify a causal effect, in this test, we use CEO turnover as a quasi-experiment. First, we identify all the CEO turnover events in our sample period. Second, we create one indicator variable equals 1 if a non-pilot CEO is replaced by a pilot CEO in the year t (treatment group), 0 if CEO does not change in the year t (control group)[16]. In our sample, we have 40 observations with non-pilot CEO replaced by pilot CEO. Third, we choose 9 firm-level variables to calculate the propensity score, including *SIZE*, *Firm Age*, *Inventory Ratio*, *LEV*, *NOA*, *Big N*, *Auditor tenure*, *Sale Growth*, and *Operating Volatility*. Fourth, we match each observation in the treatment group with one in control group with the closet propensity score within 3 percent caliper. Fifth, for each observation in the matched sample, we also identify the pre- and post-period based on event year and we create the other indicator variable: Post is 1 for the post CEO turnover period (3 years), 0 for pre-period (3 years). Then we put *Treatment*, *Post* and the interaction term *Treatment*Post* into the regression. As shown in Table 10, the coefficient of *Treatment*Post* is positive and significant in four columns out of five. The results show that after pilot CEO takes over a company, the financial reporting quality deteriorates.

6.2. Instrument Variable Method: CEO Sensation Seeking and Financial Reporting Quality

[16] In another additional test, we also consider another treatment group, which a pilot CEO is replaced by a non-pilot CEO in the year t. The control group is still the observations that CEO does not change in the year t. We find the coefficient of *Treatment*Post* is negative but insignificant.

Hiring a CEO with pilot credentials might not be a random event. In our robustness check, we employ an instrumental variable and the Heckman two-stage model to address this potential endogeneity issue. In the first stage, we predict the likelihood that a firm hires a pilot CEO. More specifically, we include firm size (*SIZE*), leverage (*LEV*), profitability (*ROA*) and firm age (*Firm Age*) of year t-1 in the regression. Based on the statistics on active aviation pilots per capita, we also include the *Pilot States*, which is equal to one if a firm is headquartered in the top 25 states of active aviation pilots per capita and zero otherwise.[17] We choose this variable as the instrumental variable for two reasons. First, if a firm is located in a state where more pilots reside, the firm would naturally have higher chance of recruiting a CEO with pilot credentials. Second, active aviation pilots per capita at the state-level should be exogenous to the individual firm.

Panel A of Table 11 reports the results of the first-stage regression. We find that the coefficient of Pilot States is significantly positive, which is consistent with our prediction. This means that if the headquarter state has more pilots per capita, chances are greater that a firm would end up with a pilot as its CEO. We calculate the *Inverse Mills Ratio* (IMR) from the first stage and include this ratio in the second stage. Panel B reports the second-stage results. After including IMR, our main results are still robust.

6.2 Propensity Score Matching Method: CEO Sensation Seeking and Financial Reporting Quality

A competing explanation for our main results is that the effects of CEO sensation seeking are produced from firms' characteristics, instead of from the pilot CEOs themselves. We employ propensity score matching (PSM) to rule out this

[17] These 25 states are Alaska, Montana, Colorado, North Dakota, Wyoming, New Hampshire, Idaho, Washington, Arizona, Utah, South Dakota, Kansas, Minnesota, Nevada, Florida, Oregon, New Mexico, Hawaii, Maine, Oklahoma, Vermont, Nebraska, Georgia, Texas and Iowa.

potential explanation. In the first stage, we use the predictors of financial reporting quality as matched variables: *Age 50-59, Age>=60, Ln(Tenure), Overconfidence, Delta, Vega, SIZE, Firm Age, Inventory Ratio, LEV, NOA, Big N, Sales Growth, Auditor Tenure* and *Operating Volatility*. We compute the propensity score based on the coefficients estimated from the first-stage regression. Then we match each treatment (firm-year with pilot CEO) with the control (firm-year without pilot CEO) having the closest propensity score (caliper=0.03). We repeat our main analysis using the PSM matched sample and find that our results remain robust (See Table 12).

7. Conclusion

In this paper, we investigate the effects of sensation seeking — a previously understudied aspect of managerial psychology — on financial reporting quality. We find evidence that firms led by CEOs with pilot credentials have lower financial reporting quality. More specifically, such firms engage in more accrual-based earnings management, have higher information opacity, are more likely to have AAER restatements, and are more likely to have internal control deficiencies. Our results suggest that the personal trait of sensation seeking has implications for financial reporting quality.

Our results have important implications for the financial reporting quality literature. Many studies have demonstrated a relationship between compensation structure, debt covenants and financial reporting quality. These studies have relied on complex contracting to establish the effect on financial reporting quality. However, sensation seeking such as piloting airplanes can serve as an *ex ante* indicator of and simple proxy for financial reporting quality.

Future research can build on studies on sensation seeking and expand to other managerial characteristics. There is a consensus in the field of personality psychology

on a general taxonomy of personality traits known as the five-factor model: openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Tupes and Christal 1961). Future research can explore how the relatively unexplored personality traits such as extraversion affect financial reporting quality.

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Appendix A

Variable name	Variable definitions and constructions
Accrual-based EM	
AM1	Abnormal Accruals estimated using a cross-sectional modified-Jones model (DeFond and Jiambalvo 1994; Dechow et al. 1995). Abnormal accruals are estimated as the residual from modified-Jones model from the following industry-year regression: $\frac{Total\_Accrual_t}{TA_{t-1}} = \lambda_1(1/TA_{t-1}) + \lambda_2(\Delta REV_t - \Delta REC_t)/TA_{t-1} + \lambda_3(PPE_t/TA_{t-1}) + \varepsilon_t$ Following Dechow et al., (1995), the estimates of λ_1, λ_2 and λ_3 are those obtained from original Jones model. Where total accrual is earnings before extraordinary items and discontinued operations minus the operating cash flows. ΔREV_t is the change of total revenue from t-1 to t year, ΔREC_t is the change of net receivables from t-1 to t year, and PPE is the gross property, plant and equipment. Source: Compustat
AM2	ROA matched modified Jones model (Kothari et al., 2005). Where ROA is return on total assets. Source: Compustat
Information Opacity	
Information Opacity1	The prior three years' moving sum of the absolute value of discretionary accruals (AM1) (Hutton et al., 2009). Source: Compustat
Information Opacity2	The prior three years' moving sum of the absolute value of discretionary accruals (AM2) (Hutton et al., 2009). Source: Compustat
Accounting Fraud	
AAER	Indicator variable that equals one for a firm-year has AAER restatement, and zero otherwise.
Internal Control Weakness	
ICD	Indicator variable that equals one for a firm-year that indicates a significant deficiency or material weakness and zero otherwise. Source: Audit Analytics
Fraud_ICD	Indicator variable that equals one if ICD related with financial fraud, irregularities, and misrepresentations. See Taxonomy of Issues for more detail. Source: Audit Analytics
Non_Fraud_ICD	Indicator variable that equals one if ICD is not related to financial fraud, irregularities, and misrepresentations. See Taxonomy of Issues for more detail. Source: Audit Analytics
Accounting Conservatism	
X_{it}	Earnings in year t scaled by lagged market value. Source: Compustat
Return	Annual accumulated return in fiscal year. Source: Compustat
DReturn	Indicator variable that equals one if the return is negative and 0 otherwise. Source: Compustat.
ΔX_{it}	The change of X_{it} from year t-1 to year t. Source: Compustat.
ΔX_{it-1}	The change of X_{it} from year t-2 to year t-1. Source: Compustat.
$D\Delta X_{it-1}$	Indicator variable that equals one if ΔX_{it-1} is negative and 0 otherwise. Source: Compustat.
CEO Sensation Seeking	
Pilot CEO	1 if CEO has had at least one certificate in FAA records, 0 otherwise. Source: Federal Aviation Administration
Age 50-59	1 if CEO's age is between 50 and 59, 0 otherwise. Source: Compustat ExecuComp
Age >=60	1 if CEO's age is larger than 60, 0 otherwise. Source: Compustat ExecuComp

Female CEO	1 if CEO is a female, 0 otherwise; Source: Compustat ExecuComp
Ln (Tenure)	Natural log of Years of service as CEO at given firm; Source: Compustat ExecuComp
Over confidence	Principle components of three overconfidence measurements: *Holder100, CAPEX, and Over-Invest. Holder100* is equal to one when the ratio of the value of options in-the-money to the average strike price exceeds 100% at least twice during the sample period, zero otherwise. *CAPEX* is equal to one if the capital expenditures deflated by lagged total assets is greater than the median level of capital expenditures to lagged total assets for the firm's Fama–French 48 industry, zero otherwise. *Over-Invest* is equal to one if the residual of a regression of total asset growth on sales growth run by industry-year is greater than zero, zero otherwise. Source: Compustat ExecuComp and Thomson Reuters
Delta	Delta refers to the change in dollar value of CEO's wealth for one percentage point change in stock price. Source: https://sites.temple.edu/lnaveen/data/
Vega	Vega refers to the change in dollar value of CEO's wealth for 0.01 change in annualized standard deviation of stock return. Source: https://sites.temple.edu/lnaveen/data/
Firm-Level Control Variables	
Size	The natural log of the total asset. Sources: Compustat
Firm Age	Natural logarithm of years since the first year covered on Compustat Sources: Compustat
Inventory Ratio	Inventory divided by total assets. Sources: Compustat
LEV	The book value of all liabilities scaled by total assets, measured at the beginning of the fiscal year. Sources: Compustat
NOA	Net operating assets, which is defined as the sum of shareholders' equity less cash and marketable securities plus total debt at the beginning of the year, scaled by total assets at the beginning of the year. Sources: Compustat
Big N	Indicator variable that equals 1 if a Big 5 or 4 audit firm was the external auditor for a firm year observation, and 0 otherwise. Sources: Compustat
Sales Growth	Growth rate in sales Sources: Compustat
Operating Volatility	Standard deviation of operating cash flows from scaled by total assets over the past five fiscal years. Source: Compustat.
Auditor Tenure	Natural log of the number of years the auditor has been with the firm. Sources: Compustat
ROA	The income before extraordinary items divided by lagged total assets.
Loss	Indicator variable that equals 1 if income before extraordinary items was negative in the current or previous two fiscal years, and 0 otherwise. Sources: Compustat
M&A	An indicator variable that equals 1 if the firm is involved in mergers or acquisitions and 0 otherwise. Sources: Compustat
Restructure	An indicator variable that equals 1 if any of RCA, RCD, RCEPS, and RCP are non-zero, and 0 otherwise. Sources: Compustat
Foreign	An indicator variable that equals 1 if the firm has a nonzero foreign currency translation and 0 otherwise. Sources: Compustat
Number of Segments	The number of business segments of the firm. Sources: Compustat
Going Concern	An indicator variable that equals 1 if the firm is issued by a going-concern opinion and 0 otherwise. Sources: Audit Analytics
Litigation Risk	Indicator variable equal to one for high litigation risk industries (SIC 2833-2836; 3570-3577; 7370-7374; 3600-3674; 5200-5961; 8731-8734) and zero otherwise, as defined in Francis et al. (1994)
Corporate Governance	
Corporate Governance	*Corporate Governance* equals 1 if G-index is lower than sample median, 0 otherwise. G-index developed by Gompers et al. (2003) with larger values of G-index indicating weaker corporate governance.
Audit Fees	
Audit Fees	The natural log of the total audit fees. Sources: Audit Analytics
Difference in Difference Test	

Treatment	An indicator variable equals 1 if a non-pilot CEO is replaced by a pilot CEO in the year t (treatment group), 0 if CEO does not change in the year t (control group).
Post	An indicator variable equals 1 for the post CEO turnover period (3 years), 0 for pre-period (3 years).

Table 1 Sample Selection and Distribution

Panel A: Sample selection

The sample consists of 11,194 firm-year observations from 1992 to 2010. Variable definitions are in the Appendix

	Number of firm years
Total firm-year observations with CEO data available on the ExecuComp database from 1992–2010	31,885
Less:	
financial services and utility industries	(4,361)
insufficient data to calculate CEO characteristics measures	(9,714)
insufficient data to calculate financial reporting quality and control	(5,616)
Final sample	11,194

Panel B: Distribution by year

Year	Frequency	Percentage	Cumulative Percentage
1992	34	0.300	0.300
1993	162	1.450	1.750
1994	275	2.460	4.210
1995	386	3.450	7.660
1996	476	4.250	11.91
1997	530	4.730	16.64
1998	594	5.310	21.95
1999	674	6.020	27.97
2000	750	6.700	34.67
2001	765	6.830	41.50
2002	789	7.050	48.55
2003	831	7.420	55.98
2004	817	7.300	63.27
2005	776	6.930	70.21
2006	760	6.790	77.00
2007	711	6.350	83.35
2008	695	6.210	89.56
2009	616	5.500	95.06
2010	553	4.940	100
Total	11,194	100	

Table 2 Descriptive Statistics and Correlation

Panel A: Descriptive Statistics

Variables	N	Mean	Std.	P25	Median	P75
Financial Reporting Quality Measures						
AM1	11,194	0.064	0.061	0.021	0.046	0.087
AM2	11,194	0.076	0.072	0.025	0.055	0.103
Information Opacity1	11,194	0.236	0.173	0.114	0.188	0.304
Information Opacity2	11,194	0.204	0.147	0.103	0.164	0.256
AAER	11,194	0.017	0.131	0.000	0.000	0.000
ICD	6,548	0.089	0.237	0.000	0.000	0.000
Fraud_ICD	6,548	0.002	0.037	0.000	0.000	0.000
Non_Fraud_ICD	6,548	0.087	0.283	0.000	0.000	0.000
CEO Characteristics						
Pilot CEO	11,194	0.051	0.220	0.000	0.000	0.000
Age 50-59	11,194	0.249	0.432	0.000	0.000	0.000
Age >=60	11,194	0.725	0.447	0.000	1.000	1.000
Female CEO	11,194	0.026	0.158	0.000	0.000	0.000
Ln (Tenure)	11,194	1.412	0.719	1.099	1.386	1.946
Over confidence	11,194	0.814	0.537	0.441	0.637	1.078
Delta	11,194	135.50	334.20	4.55	30.83	105.90
Vega	11,194	42.60	86.45	2.08	12.20	40.53
Firm Characteristics						
SIZE	11,194	7.213	1.519	6.115	7.089	8.178
Firm Age	11,194	2.997	0.739	2.398	3.045	3.689
Inventory Ratio	11,194	0.121	0.118	0.022	0.098	0.175
LEV	11,194	0.519	0.216	0.367	0.523	0.656
NOA	11,194	0.534	0.499	0.000	1.000	1.000
Big N	11,194	0.692	0.462	0.000	1.000	1.000
Auditor tenure	11,194	2.260	0.889	1.792	2.398	2.996
Sales growth	11,194	0.108	0.266	-0.013	0.076	0.180
Operating Volatility	11,194	0.053	0.052	0.024	0.040	0.065

Panel B: Pearson Correlation

		A	B	C	D	E	F	G	H	I
Pilot CEO	A	1.00								
AM1	B	**0.02**	1.00							
AM2	C	0.01	**0.64**	1.00						
Information	D	**0.03**	**0.24**	**0.30**	1.00					
Information	E	**0.02**	**0.29**	**0.23**	**0.77**	1.00				
AAER	F	**0.05**	0.01	**0.02**	**0.06**	0.03	1.00			
ICD	G	**0.02**	0.02	**0.02**	**0.00**	0.**01**	0.01	1.00		
Fraud_ICD	H	**0.03**	0.01	0.00	**0.04**	**0.04**	**0.08**	**0.04**	1.00	
Non_Fraud_ICD	I	**0.02**	0.00	0.00	**0.03**	0.02	**0.07**	0.01	**0.17**	1.00

Panel B reports Pearson correlations between the pilot CEOs and financial reporting quality. Bolded coefficients are significant at p<0.1 (two-tailed test)

Table 3 CEO Sensation-seeking and Accrual-based Earnings Management

This table presents the regression results of the impact of CEO sensation-seeking on the accrual earnings management. To conserve space, we do not report the coefficient estimates for the year and industry dummies. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust and clustered at the firm-year level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively. All variables are defined in the Appendix.

	(1) *AM1*	(2) *AM2*
Pilot CEO	0.008**	0.007***
	(2.38)	(2.72)
Age 50-59	-0.006	-0.003
	(-1.39)	(-0.71)
Age >=60	-0.003	0.000
	(-0.62)	(0.02)
Female CEO	0.001	0.007*
	(0.14)	(1.81)
Ln (Tenure)	-0.003***	-0.002***
	(-2.78)	(-2.83)
Over confidence	0.000	0.002*
	(0.23)	(1.94)
Delta	0.000	-0.000
	(0.81)	(-0.77)
Vega	-0.000	0.000
	(-1.41)	(1.13)
SIZE	-0.003***	-0.003***
	(-4.54)	(-5.70)
Firm Age	-0.002*	-0.004***
	(-1.83)	(-4.52)
Inventory Ratio	0.036***	-0.004
	(3.98)	(-0.45)
LEV	0.015***	0.013***
	(3.75)	(3.84)
NOA	-0.006***	-0.005***
	(-4.10)	(-4.04)
Big N	-0.004	-0.006*
	(-1.13)	(-1.91)
Auditor tenure	-0.001	-0.000
	(-1.10)	(-0.25)
Sales growth	0.019***	0.017***
	(4.94)	(5.09)
Operating Volatility	0.198***	0.278***
	(8.58)	(15.86)
Intercept	0.049***	0.051***
	(3.44)	(3.86)
IND/YEAR	CONTROL	CONTROL
No. of observations	11,194	11,194
Adjusted R^2	0.144	0.135

Table 4 CEO Sensation-seeking and Information Opacity

This table presents the regression results of the impact of CEO sensation-seeking on the information opacity. To conserve space, we do not report the coefficient estimates for the year and industry dummies. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust and clustered at the firm-year level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively. All variables are defined in the Appendix.

	(1)	(2)
	Information Opacity1	*Information Opacity2*
Pilot CEO	0.033***	0.020***
	(4.62)	(3.64)
Age 50-59	-0.005	-0.009
	(-0.50)	(-1.05)
Age >=60	-0.002	-0.012
	(-0.23)	(-1.36)
Female CEO	0.005	0.019**
	(0.57)	(2.40)
Ln (Tenure)	-0.003	-0.003*
	(-1.30)	(-1.79)
Over confidence	-0.001	-0.002
	(-0.20)	(-0.84)
Delta	0.000*	0.000*
	(1.82)	(1.90)
Vega	-0.000	0.000
	(-1.42)	(1.28)
SIZE	-0.004***	-0.003***
	(-2.66)	(-2.73)
Firm Age	-0.020***	-0.030***
	(-7.76)	(-13.54)
Inventory Ratio	0.124***	-0.017
	(6.16)	(-0.95)
LEV	-0.001	-0.006
	(-0.06)	(-0.79)
NOA	-0.013***	-0.018***
	(-4.22)	(-7.27)
Big N	-0.007	-0.007
	(-0.93)	(-1.00)
Auditor tenure	-0.008***	-0.006***
	(-4.34)	(-3.84)
Sales growth	0.024***	0.028***
	(2.98)	(4.23)
Operating Volatility	0.930***	0.981***
	(15.22)	(16.99)
Intercept	0.097***	0.177***
	(3.86)	(7.92)
IND/YEAR	CONTROL	CONTROL
No. of observations	11,194	11,194
Adjusted R^2	0.296	0.303

Table 5 CEO Sensation-seeking and Accounting Fraud

This table presents the regression results of the impact of CEO sensation-seeking on the AAER accounting fraud. To conserve space, we do not report the coefficient estimates for the year and industry dummies. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust and clustered at the firm-year level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively. All variables are defined in the Appendix.

	(1)
	AAER
Pilot CEO	0.028***
	(3.22)
Age 50-59	0.014**
	(2.50)
Age >=60	-0.004
	(-0.70)
Female CEO	0.011
	(1.18)
Ln (Tenure)	-0.001
	(-0.40)
Over confidence	0.005**
	(2.03)
Delta	0.000
	(0.63)
Vega	-0.000
	(-0.04)
SIZE	0.007***
	(5.70)
Firm Age	-0.002
	(-0.87)
Inventory Ratio	0.066***
	(3.71)
LEV	0.011*
	(1.75)
NOA	0.012***
	(4.55)
Big N	-0.027***
	(-3.38)
Auditor tenure	-0.001
	(-0.65)
Sales growth	0.010
	(1.58)
Operating Volatility	-0.023
	(-0.82)
Intercept	-0.078***
	(-5.89)
IND/YEAR	CONTROL
No. of observations	11,194
Pseudo R^2	0.036

Table 6 CEO Sensation-seeking and Financial Reporting Quality: Corporate Governance Effects

This table presents the regression results of the impact of corporate governance on the relation between CEO sensation-seeking and financial reporting quality. To conserve space, we do not report the coefficient estimates for the year and industry dummies. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust and clustered at the firm-year level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively. All variables are defined in the Appendix.

	(1) *AM1*	(2) *AM2*	(3) *Information Opacity1*	(4) *Information Opacity2*	(5) *AAER*
Pilot CEO	0.008**	0.008**	0.036***	0.023***	0.022**
	(2.22)	(2.51)	(4.41)	(3.74)	(2.46)
Corporate Governance	-0.000	-0.000	0.001	0.000	-0.002***
	(-0.63)	(-1.52)	(1.19)	(0.45)	(-3.71)
Pilot CEO* Corporate Governance	-0.003	-0.002	-0.010	-0.013	0.021
	(-0.41)	(-0.39)	(-0.58)	(-1.05)	(0.97)
Age 50-59	-0.006	-0.003	-0.005	-0.009	0.015**
	(-1.38)	(-0.68)	(-0.51)	(-1.05)	(2.54)
Age >=60	-0.003	0.000	-0.003	-0.012	-0.003
	(-0.61)	(0.04)	(-0.24)	(-1.37)	(-0.61)
Female CEO	0.001	0.007*	0.005	0.019**	0.011
	(0.13)	(1.79)	(0.58)	(2.40)	(1.15)
Ln (Tenure)	-0.003***	-0.003***	-0.003	-0.003*	-0.001
	(-2.80)	(-2.87)	(-1.29)	(-1.80)	(-0.44)
Over confidence	0.000	0.002*	-0.000	-0.00200	0.004*
	(0.22)	(1.92)	(-0.17)	(-0.82)	(1.96)
Delta	0.000	-0.000	0.000*	0.000*	0.000
	(0.80)	(-0.80)	(1.84)	(1.91)	(0.57)
Vega	-0.000	0.000	-0.000	0.000	-0.000
	(-1.41)	(1.12)	(-1.42)	(1.29)	(-0.06)
SIZE	-0.003***	-0.003***	-0.004***	-0.003***	0.007***
	(-4.53)	(-5.68)	(-2.68)	(-2.74)	(5.75)
Firm Age	-0.002*	-0.004***	-0.020***	-0.030***	-0.00100
	(-1.72)	(-4.23)	(-7.83)	(-13.41)	(-0.27)
Inventory Ratio	0.036***	-0.004	0.124***	-0.0170	0.065***
	(3.94)	(-0.50)	(6.16)	(-0.97)	(3.70)
LEV	0.016***	0.014***	-0.00100	-0.00600	0.013**
	(3.77)	(3.91)	(-0.12)	(-0.82)	(1.96)
NOA	-0.006***	-0.005***	-0.013***	-0.018***	0.011***
	(-4.10)	(-4.05)	(-4.19)	(-7.25)	(4.49)
Big N	-0.004	-0.006*	-0.008	-0.007	-0.027***
	(-1.12)	(-1.89)	(-0.95)	(-1.02)	(-3.33)
Auditor tenure	-0.001	0.000	-0.008***	-0.006***	-0.001
	(-1.10)	(-0.27)	(-4.30)	(-3.80)	(-0.75)
Sales growth	0.019***	0.017***	0.024***	0.028***	0.010
	(4.94)	(5.09)	(2.97)	(4.22)	(1.60)
Operating Volatility	0.198***	0.278***	0.930***	0.981***	-0.0250
	(8.56)	(15.79)	(15.26)	(17.02)	(-0.88)
Intercept	0.051***	0.054***	0.092***	0.176***	-0.065***
	(3.50)	(4.02)	(3.62)	(7.79)	(-4.74)
IND/YEAR	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL
No. of observations	11,194	11,194	11,194	11,194	11,194
Adjusted R^2 /Pseudo R^2	0.143	0.135	0.296	0.303	0.0373

Table 7 CEO Sensation-seeking and Internal Control Quality

This table presents the regression results of the impact of CEO sensation-seeking on the internal control weakness. To conserve space, we do not report the coefficient estimates for the year and industry dummies. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust and clustered at the firm-year level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively. All variables are defined in the Appendix.

	(1)	(2)	(3)
	ICD	*Fraud_ICD*	*Non_Fraud_ICD*
Pilot CEO	0.036**	0.005**	0.030*
	(2.10)	(2.17)	(1.79)
Age 50-59	-0.011	0.001	-0.012
	(-0.62)	(0.36)	(-0.68)
Age >=60	-0.014	0.003	-0.016
	(-0.75)	(0.96)	(-0.90)
Female CEO	0.037*	-0.001	0.038*
	(1.81)	(-0.32)	(1.87)
Ln (Tenure)	-0.015***	-0.002**	-0.013***
	(-2.88)	(-1.98)	(-2.60)
Over confidence	-0.004	-0.001	-0.003
	(-0.50)	(-0.49)	(-0.43)
Delta	-0.000	-0.000	-0.000
	(-1.34)	(-0.57)	(-1.26)
Vega	0.000	-0.000	0.000
	(1.55)	(-0.02)	(1.56)
SIZE	-0.011***	-0.000	-0.011***
	(-3.61)	(-0.71)	(-3.53)
ROA	-0.112***	-0.004	-0.108***
	(-4.27)	(-1.04)	(-4.15)
Firm Age	0.016***	0.001	0.015**
	(2.59)	(0.67)	(2.51)
Inventory Ratio	-0.038	-0.008	-0.030
	(-0.86)	(-1.23)	(-0.68)
M&A	0.011	0.000	0.011
	(1.54)	(0.25)	(1.51)
Sales Growth	0.013	-0.000	0.013
	(0.80)	(-0.02)	(0.81)
Restructure	0.027***	-0.001	0.027***
	(3.44)	(-0.45)	(3.54)
Foreign	0.033***	0.003**	0.030***
	(4.14)	(2.26)	(3.84)
Number of Segments	-0.001	-0.000	-0.001
	(-0.71)	(-0.22)	(-0.68)
Intercept	-0.008	-0.001	-0.007
	(-0.12)	(-0.12)	(-0.11)
IND/YEAR	CONTROL	CONTROL	CONTROL
No. of observations	6548	6548	6548
Pseudo R^2	0.052	0.010	0.0500

Table 8 CEO Sensation-seeking and Accounting Conservatism

This table presents the regression results of the impact of CEO sensation-seeking on audit fees. To conserve space, we do not report the coefficient estimates for the year and industry dummies. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust and clustered at the firm-year level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively. All variables are defined in the Appendix.

Panel A: Earnings-Price model

	(1) X_{it}	(2) X_{it}
DReturn	0.022***	0.027
	(4.44)	(0.96)
Return	-0.012	-0.090**
	(-1.02)	(-2.49)
*DReturn*Return*	0.307***	0.502***
	(9.77)	(5.90)
Pilot CEO	-0.019*	-0.009
	(-1.83)	(-0.88)
*Pilot CEO *DReturn*	-0.026***	-0.027***
	(-2.62)	(-3.28)
*Pilot CEO *Return*	0.072	0.036
	(1.59)	(0.82)
Pilot CEO *DReturn*Return	**-0.341*** **	**-0.253*** **
	(-4.20)	**(-2.83)**
Size		0.009***
		(5.07)
*Size *DReturn*		-0.061***
		(-4.86)
*Size *Return*		0.013**
		(2.30)
*Size *DReturn*Return*		-0.003
		(-0.96)
Lev		-0.081***
		(-6.17)
*Lev*DReturn*		0.468***
		(5.71)
*Lev*Return*		0.002
		(0.04)
*Lev*DReturn*Return*		0.053**
		(2.30)
Over confidence		0.027***
		(4.09)
*Over confidence *DReturn*		-0.153***
		(-6.74)
*Over confidence *Return*		0.004
		(0.34)
*Over confidence *DReturn*Return*		-0.022***
		(-3.78)
Intercept	0.017	-0.036
	(0.62)	(-1.46)
IND & YEAR	CONTROL	CONTROL
No. of observations	10,867	10,867
Adjusted R2	0.157	0.247

Panel B: Earnings Change model

	(1) ΔX_{it}	(2) ΔX_{it}
$D\Delta X_{it-1}$	-0.018***	-0.010
	(-7.80)	(-0.72)
ΔX_{it-1}	0.008	0.209
	(0.27)	(1.25)
$D\Delta X_{it-1}$*ΔX_{it-1}	-0.693***	-0.019
	(-16.32)	(-0.08)
Pilot CEO	-0.010	-0.006
	(-1.42)	(-0.88)
Pilot CEO *$D\Delta X_{it-1}$	0.048***	0.043***
	(4.60)	(3.96)
Pilot CEO * ΔX_{it-1}	0.630	0.447
	(1.36)	(0.99)
***Pilot CEO* $D\Delta X_{it-1}$*ΔX_{it-1}**	**3.212*** **	**3.307*** **
	(2.73)	**(2.91)**
Size		0.003**
		(1.97)
*Size**$D\Delta X_{it-1}$		-0.001
		(-0.62)
*Size** ΔX_{it-1}		-0.034
		(-1.30)
*Size**$D\Delta X_{it-1}$*ΔX_{it-1}		-0.079**
		(-2.10)
Lev		-0.048***
		(-4.60)
*Lev**$D\Delta X_{it-1}$		0.017
		(1.18)
*Lev** ΔX_{it-1}		0.001
		(0.01)
*Lev**$D\Delta X_{it-1}$*ΔX_{it-1}		-0.208
		(-0.96)
Over confidence		0.017***
		(7.08)
Over confidence *$D\Delta X_{it-1}$		-0.006
		(-1.57)
Over confidence * ΔX_{it-1}		0.042
		(1.25)
Over confidence *$D\Delta X_{it-1}$*ΔX_{it-1}		-0.031
		(-0.65)
Intercept	-0.032*	-0.043*
	(-1.71)	(-1.95)
IND & YEAR	CONTROL	CONTROL
No. of observations	11,092	11,092
Adjusted R2	0.178	0.204

Table 9 CEO Sensation-seeking and Audit Pricing

This table presents the regression results of the impact of CEO sensation-seeking on audit fees. To conserve space, we do not report the coefficient estimates for the year and industry dummies. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust and clustered at the firm-year level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively. All variables are defined in the Appendix.

	(1) *Audit Fees*
Pilot CEO	0.104***
	(2.87)
Age 50-59	-0.206***
	(-5.83)
Age >=60	-0.120***
	(-3.38)
Female CEO	0.046
	(1.18)
Ln (Tenure)	-0.049***
	(-4.38)
Over confidence	-0.035**
	(-2.40)
SIZE	0.612***
	(97.98)
ROA	-0.235***
	(-4.01)
Loss	0.121***
	(6.75)
Firm Age	0.077***
	(6.40)
Inventory Ratio	0.160*
	(1.72)
M&A	0.070***
	(4.54)
Sales growth	-0.116***
	(-3.34)
Restructure	0.147***
	(8.99)
Foreign	0.246***
	(15.49)
Number of Segments	0.008***
	(4.38)
Going Concern	0.108
	(1.05)
Litigation Risk	-0.077**
	(-2.44)
Intercept	2.932***
	(26.30)
IND/YEAR	CONTROL
No. of observations	7,688
Adjusted R^2	0.720

Table 10 CEO Sensation-seeking and Financial Reporting Quality: Difference in Difference

This table presents the regression results of the impact of corporate governance on the relation between CEO sensation-seeking and financial reporting quality. To conserve space, we do not report the coefficient estimates for the year and industry dummies. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust and clustered at the firm-year level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively. All variables are defined in the Appendix.

	(1) *AM1*	(2) *AM2*	(3) *Information Opacity1*	(4) *Information Opacity2*	(5) *AAER*
Treatment	-0.037*	-0.0140	-0.157***	-0.076**	-0.155***
	(-1.88)	(-0.94)	(-3.55)	(-2.45)	(-3.65)
Post	-0.017*	0.00200	0.00900	0.0170	0.055*
	(-1.77)	(0.26)	(0.49)	(0.99)	(1.69)
Treatment*Post	**0.062*** **	**0.012**	**0.199*** **	**0.071***	**0.096***
	(2.85)	**(0.76)**	**(4.02)**	**(1.93)**	**(1.74)**
Age 50-59	0.000	0.000	0.000**	0.000	-0.000
	(0.57)	(0.16)	(2.13)	(0.97)	(-0.77)
Female CEO	-0.000	-0.000	-0.000	0.000	-0.000
	(-0.36)	(-0.89)	(-1.30)	(0.20)	(-0.17)
Ln (Tenure)	0.0200	0.022**	0.086***	0.051**	0.007
	(1.52)	(2.26)	(3.01)	(2.28)	(0.20)
Over confidence	-0.004	-0.059*	-0.038	-0.113**	-0.081
	(-0.19)	(-1.96)	(-0.73)	(-2.54)	(-1.24)
Delta	0.004	0.000	0.030*	0.007	-0.025
	(0.56)	(0.04)	(1.93)	(0.55)	(-0.89)
Vega	0.014*	0.001	-0.002	-0.026*	0.049*
	(1.83)	(0.13)	(-0.14)	(-1.85)	(1.73)
SIZE	-0.002	0.000	-0.006	0.001	0.054***
	(-0.40)	(0.02)	(-0.65)	(0.15)	(3.41)
Firm Age	-0.021*	-0.025***	-0.061**	-0.090***	-0.023
	(-1.82)	(-2.62)	(-2.52)	(-4.82)	(-0.58)
Inventory Ratio	0.036	-0.035	-0.050	-0.006	0.135
	(0.39)	(-0.50)	(-0.31)	(-0.05)	(0.52)
LEV	0.072*	0.082**	0.050	0.111*	0.0230
	(1.77)	(2.47)	(0.70)	(1.76)	(0.28)
NOA	-0.002	-0.013*	-0.036*	-0.040***	0.047*
	(-0.20)	(-1.87)	(-1.87)	(-2.86)	(1.68)
Big N	0.014	0.004	-0.089	-0.062	-0.053
	(0.56)	(0.18)	(-1.57)	(-1.23)	(-1.04)
Auditor tenure	-0.008*	-0.005	-0.015	-0.005	-0.026*
	(-1.75)	(-1.34)	(-1.54)	(-0.61)	(-1.67)
Sales growth	-0.017	0.001	0.068*	0.053	0.079
	(-0.75)	(0.06)	(1.79)	(1.60)	(1.41)
Operating Volatility	-0.066	0.068	0.220	0.608**	0.341
	(-0.35)	(0.46)	(0.59)	(2.11)	(0.77)
Intercept	0.0690	0.100**	0.218**	0.229***	-0.359**
	(1.49)	(2.50)	(2.17)	(2.77)	(-2.35)
IND/YEAR	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL
No. of observations	353	353	353	353	353
Adjusted R^2 /Pseudo R^2	0.0843	0.162	0.412	0.408	0.182

Table 11: Instrument Variable Method: CEO Sensation-seeking and Financial Reporting Quality

This table presents the regression results of the impact of CEO sensation-seeking on financial reporting quality by using instrument variable method. Panel A reports the Probit Regression of hiring pilot CEO. Panel B reports OLS/Logit regression of Pilot CEOs and financial reporting quality by including Inverse Mills Ratio (IMR). To conserve space, we do not report the coefficient estimates for the year and industry dummies. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust and clustered at the firm-year level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively. All variables are defined in the Appendix.

Panel A: First Stage: Regression of hiring pilot CEOs

	Model 1
	Pilot CEO
$SIZE_{t-1}$	0.014
	(0.77)
LEV_{t-1}	0.047
	(0.36)
ROA_{t-1}	-0.583***
	(-4.35)
Firm Age_{t-1}	0.052
	(1.53)
Pilot $States_{t-1}$	0.286***
	(6.42)
Intercept	-6.431***
	(-31.31)
IND/YEAR	CONTROL
No. of observations	9,612
Pseudo R^2	0.105

Panel B: CEO sensation-seeking and Financial Reporting: IV method

	(1)	(2)	(3)	(4)	(5)
	AM1	*AM2*	*Information Opacity1*	*Information Opacity2*	*AAER*
Pilot CEO	0.007*	0.007***	0.031***	0.019**	0.031***
	(1.92)	(2.95)	(2.63)	(2.27)	(3.28)
IMR	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES
No. of observations	9,612	9,612	9,612	9,612	9,612
Adjusted R^2*/Pseudo* R^2	0.123	0.0820	0.221	0.182	0.0341

Table 12: Propensity Score Matching Method: CEO Sensation-seeking and Financial Reporting Quality

This table presents the regression results of the impact of CEO sensation-seeking on financial reporting quality by using propensity score matching method. Panel A reports the Probit Regression of hiring pilot CEO. Panel B reports OLS/Logit regression of Pilot CEOs and financial reporting quality by including Inverse Mills Ratio (IMR). To conserve space, we do not report the coefficient estimates for the year and industry dummies. The t-statistics reported in parentheses are based on standard errors that are heteroskedasticity robust and clustered at the firm-year level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels (two-tailed), respectively. All variables are defined in the Appendix.

Panel A: First Stage: Calculating Propensity Score

	Model 1
	Pilot CEO
Age 50-59	1.120*
	(1.84)
Age >=60	1.520**
	(2.54)
Ln (Tenure)	0.307***
	(4.23)
Over confidence	0.036
	(0.42)
Delta	-0.000
	(-1.32)
Vega	0.001
	(0.90)
SIZE	-0.041
	(-0.91)
Firm Age	0.087
	(1.18)
Inventory Ratio	-0.871
	(-1.31)
LEV	0.386
	(1.41)
NOA	0.0410
	(0.44)
Big N	0.659***
	(3.07)
Auditor tenure	-0.111**
	(-2.17)
Sales growth	0.012
	(0.06)
Operating Volatility	-0.454
	(-0.41)
Intercept	-17.125***
	(-16.45)
IND/YEAR	CONTROL
No. of observations	11,194
Pseudo R^2	0.097

Panel B: CEO sensation-seeking and Financial Reporting: PSM method

	(1)	(2)	(3)	(4)	(5)
	AM1	*AM2*	*Information Opacity1*	*Information Opacity2*	*AAER*
Pilot CEO	0.012***	0.011***	0.031**	0.021*	0.023**
	(2.90)	(3.41)	(2.20)	(1.94)	(2.18)
IMR	YES	YES	YES	YES	YES
Control	YES	YES	YES	YES	YES
No. of observations	1,144	1,144	1,144	1,144	1,144
Adjusted R^2 /Pseudo R^2	0.133	0.150	0.321	0.326	0.0473